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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND
INTERFERENCES

In re Appeal of

Katou et al.

Serial No.: 10/702,038

Group Art Unit: 3676

Filed: November 6, 2003

Examiner: Christopher J. Boswell

For: LOCK APPARATUS

Mail Stop Appeal Brief
Honorable Commissioner of Patents
Alexandria, VA 22313 - 1450

RESPONSE TO NOTIFICATION OF NON-COMPLIANT APPEAL BRIEF

Sir:

Appellants enclose an amended Brief on Appeal in response to the Notification of Non-Compliant Appeal Brief dated March 15, 2007.

Appellants respectfully submit that the enclosed Brief on Appeal fully complies with all requirements of 37 C.F.R. 41.37. Should the Examiner find the Brief on Appeal to be other than in compliance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date:

3/27/07

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BRIEF ON APPEAL

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I. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Piolax Inc. and Kanto Auto Works, Ltd. by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 015435, Frame 0984.

II. RELATED APPEALS AND INTERFERENCES

There are presently no appeals or interferences, known to the Appellants, the Appellants' representatives or the Assignee, which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-2, 5-12, and 21-26 stand finally rejected and claims 3-4 and 13-20 would be allowable if rewritten into independent form.

Appellants appeal the final rejections of claims 1-2, 5-12, and 21-26.

IV. STATUS OF AMENDMENTS

An Amendment After Final Rejection was filed on March 7, 2006. By an Advisory Action mailed March 27, 2006, the Examiner indicated that the Amendment would be entered upon filing of a Notice of Appeal and an Appeal Brief. The Notice of Appeal was filed on April 20, 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A first exemplary embodiment of the claimed invention, as defined by, for example, independent claim 1, is directed to a lock apparatus (Figure 11) for attaching a container member B to a support member P (Figure 16), openably. The lock apparatus includes an operation handle 101 (page 20, lines 9-10), a spring 105 (page 20, line 12), which is movably supported by the container member B, a slide pin 103, which is urged in a direction of a lock hole H defined on the support member P by the spring 105, respectively (page 20, lines 19-21), a cam member 104 to which a rear end portion of the slide pin 103 is fitted to urge the slide pin 103 to project and retract (page 20, lines 18-19), and an O-ring 124 in a containing groove 125 of the cam member 104 (page 26, line 14, Figures 14A – 14E). When the operation handle 101 is operated in a swing manner, a front end portion of the slide pin 103 is

retracted from the lock hole H of the support member P against pressure of the spring 103 (page 30, lines 6-15), and the containing groove 125 communicates with a cam groove 120 on the cam member 104 (page 26, lines 15-16).

A second exemplary embodiment of the claimed invention, as defined by, for example, independent claim 10, is directed to a lock (Figure 11) that includes a cam 104 with a pair of engaging holes 117, a slide pin 103 with a bifurcated structure that has elastic pieces that each include projections 114 that each engage a corresponding one of the pair of engaging holes (page 23, line 25 – page 24, line 6), and an O-ring 124 in a containing groove 125 on the cam 104 (page 26, line 14, Figures 14A – 14E). The containing groove 125 communicates with a cam groove 120 in the cam 104 (page 26, lines 15-16).

A third exemplary embodiment of the claimed invention, as defined by, for example, independent claim 25, is directed to a lock apparatus (Figure 1) for attaching a container member B to a support member P (Figure 8), openably. The lock apparatus includes an operation handle 1 (page 13, lines 23-24), a spring 5 (page 14, line 1) which is movably supported by the container member B, a slide pin 3 which is urged in a direction of lock holes H defined on the support member P by the spring 5 (page 14, lines 7-9), and a cam member 4 to which a rear end portion of the slide pin 3 is fitted to urge the slide pin 3 to project and retract (page 14, lines 6-7). When the operation handle 1 is operated in a swing manner, a front end portion of the slide pin 3 is retracted from a lock hole H of the support member P against pressure of the spring 3 (page 18, line 20 – page 19, line 3). Engagement holes 15 are defined on opposed surfaces of a front end portion of the cam member 4 having a cylindrical portion (page 15, lines 13-17). A rear end portion of the slide pin 3 is formed in a bifurcated structure comprising elastic pieces 11 (page 14, line 23 – page 15, line 1). Each of the elastic pieces 11 includes a protrusion 12 for detachably engaging with the engagement holes 15 (page 15, lines 1-3). Rotation of the slide pin 3 with respect to the cam member 4 disengages the protrusions 12 from the engagement holes 15 (page 19, lines 4 – 10, Figures 10A and 10B).

A fourth exemplary embodiment of the claimed invention, as defined by, for example, independent claim 26, is directed to a lock (Figure 1) that includes a cam 4 with a pair of engaging holes 15 (page 15, lines 13-17), and a slide pin 3 with a bifurcated structure that includes elastic pieces 11 (page 14, line 23 – page 15, line 1) that each have projections 12 that each engage a corresponding one of the pair of engaging holes 15 (page 15, lines 1-3).

Rotation of the slide pin 3 with respect to the cam 5 disengages the projections 12 from the engagement holes 15 (page 19, lines 4-10, Figures 10A and 10B).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 25-26 are unpatentable under 35 U.S.C. 103 over the Taranto reference.
2. Whether claims 1-2, 5-9, and 22-24 are unpatentable under 35 U.S.C. 103 over the Taranto reference in view of the Jackson et al. reference.
3. Whether claims 10-12, and 21 are unpatentable under 35 U.S.C. 103 over the Taranto reference in view of the Jackson et al. reference.

VII. ARGUMENTS

1. It would not have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of the Taranto reference to form the invention of claims 25-26.

Regarding the rejection of claims 25-26, the Examiner alleges that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of the Taranto reference to form the claimed invention. Appellants submit, however, that it would not have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of the Taranto reference to form the claimed invention.

While the Examiner has acknowledged that “Claim 26 has a different scope then (sic) that of claim 25” (page 2, Notification of Non-Compliance), the Appellants are traversing the ground of rejection that was presented in the October 25, 2005, Office Action on the basis that the Examiner has failed to present a *prima facie* case of obviousness for both of these claims. The Examiner presented a single ground of rejection for both of these claims and Appellants respectfully traverse this single ground of rejection.

The Examiner fails to present a *prima facie* case of obviousness for at least two reasons: 1) the Examiner has failed to provide any suggestion and/or motivation which would motivate one of ordinary skill in the art to replace the engagement groove that is disclosed by the Taranto reference with engagement holes (claim 25, or engaging holes of claim 26); and 2) the Examiner has failed to provide any reference which discloses engagement holes (claim 25, or engaging holes of claim 26), let alone that teaches that engagement holes (claim 25, or

engaging holes of claim 26) are the functional equivalent of the engagement groove.

“ESTABLISHING A PRIMA FACIE CASE OF OBVIOUSNESS”

“To establish a prima facie case of obviousness three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine references teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.” (Emphasis original, M.P.E.P. § 2142, see also § 2143).

In the present instance, the Examiner has failed to present a *prima facie* case of obviousness by failing to provide “some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference” and by failing to provide a prior art reference that teaches or suggests all the claim limitations.

The Examiner admits that the Taranto reference “does not disclose engagement holes.” The Examiner does not provide any prior art reference which teaches engagement holes. Therefore, the Examiner clearly fails to satisfy the requirement for a *prima facie* case of obvious of a “prior art reference (or references when combined) must teach or suggest all the claim limitations.”

The Examiner also fails to present a *prima facie* case of obviousness by failing to provide “some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference.”

Rather, the Examiner merely alleges that engagement holes are the “functional equivalents” to the annular recess 62 that is disclosed by the Taranto reference.

“COMBINING EQUIVALENTS KNOWN FOR THE SAME PURPOSE”

“It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose . . . [T]he idea of combining them flows logically from their having been individually taught in the prior art.” (Emphasis added, M.P.E.P. § 2144.06).

In the present instance, the idea of combining them cannot “flow” because they are not “individually taught” in the applied references. The Examiner has not provided a prior art reference that discloses engagement holes, let alone a prior art reference which teaches that engagement holes are the functional equivalent of an annular groove.

Moreover, even assuming for the sake of argument, that the Examiner is able to locate prior art which not only discloses engagement holes, but which also teaches that engagement holes are the functional equivalent of the annular groove that is disclosed by the Taranto reference, such teachings would still be insufficient to provide a *prima facie* case of obviousness.

***“SUBSTITUTING EQUIVALENTS KNOWN FOR THE SAME
PURPOSE”***

“In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant’s disclosure or the mere fact that the components at issue are function or mechanical equivalents. . . .The Board found the claimed invention would have been obvious, reasoning that the prior art foam core is the function and mechanical equivalent of the claimed paper core. The court reversed, holding that components which are functionally or mechanically equivalent are not necessarily obvious in view of one another . . .Smith v. Hayashi.”

Therefore, even if the Examiner was able to locate prior art which not only discloses engagement holes, but which also teaches that engagement holes are the functional equivalent of the annular groove that is disclosed by the Taranto reference, such a disclosure of functional equivalency is not sufficient to establish a *prima facie* case of obviousness. The Examiner would still be required to provide a motivation for one of ordinary skill in the art to substitute engagement holes for the annular groove.

Clearly, the Examiner has not even attempted to allege any motivation at all. Therefore, the Examiner fails to present a *prima facie* case of obviousness.

Indeed, the Examiner’s allegation that such are “functional equivalents” nullifies any future attempt by the Examiner to allege that one of ordinary skill in the art would have been motivated to substitute engagement holes for the annular recess 62. Even assuming arguendo that the Examiner had cited a prior art reference which disclosed engagement holes as recited

by the claims, one of ordinary skill in the art would not have been motivated to replace the annular recess 62 with such engagement holes because the Examiner has admitted that the annular recess 62 is the functional equivalent of engagement holes. If, as alleged by the Examiner, they are functionally equivalent, there clearly can be no motivation to replace the annular groove that is disclosed by the Taranto reference by engagement holes (which are not disclosed anywhere).

Therefore, one of ordinary skill in the art would not have been motivated to modify the teachings of the Taranto reference to form the claimed invention. Appellants respectfully request withdrawal of this rejection.

2. The Taranto and Jackson et al. references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the invention of claims 1-2, 5-9, and 22-24.

Regarding the rejections of claims 1-2, 5-9, and 22-24, the Examiner alleges that the Jackson et al. reference would have been combined with the Taranto reference to form the claimed invention. Appellants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

None of the applied references teaches or suggests the features of the claimed invention including a lock with an O-ring in a containing groove on a cam where the containing groove communicates with a cam groove in the cam. As explained above, this feature is important for providing a sliding resistance that restrains any impact noise while enabling the cam member to be downsized.

Indeed, the Examiner never alleges that any of the applied references teaches or suggests these features.

The Examiner admits that the Taranto reference does not teach or suggest an O-ring.

The Examiner attempts to remedy this deficiency by referring to the Jackson et al. reference. However, the Jackson et al. reference does not remedy all of the deficiencies of the Taranto reference because the Jackson et al. reference also does not teach or suggest an O-ring in a containing groove on a cam where the containing groove communicates with a cam groove in the cam.

Further, Appellants respectfully submit that, contrary to the Examiner's allegation,

one of ordinary skill in the art would not have been motivated to modify the teachings of the Taranto reference with the O-ring that is disclosed by the Jackson et al. reference “in order to create a fluid-tight seal.”

The Jackson et al. reference teaches that the motivation for providing a fluid-tight seal is that the latch mechanism that is disclosed by the Jackson et al. reference is intended to be used on an exterior panel of an aircraft so as to secure a first aircraft structure, such as an aircraft panel or cowling, to a second aircraft structure, and that it is desirable to prevent a flow through the latch mechanism “into the interior of the aircraft” and also to prevent “Fluid, such as pressurized air, flowing outwardly from an internal compartment of an aircraft.”

The latch structure that is disclosed by the Taranto reference does not suffer from these problems.

Indeed, it is not possible to use the latch structure that is disclosed by the Taranto reference to secure a first panel to a second panel, let alone to “secure a first aircraft structure, such as an aircraft panel or cowling, to a second aircraft structure.”

Rather, and in stark contrast, the latch that is disclosed by the Taranto reference is intended to be used and is only disclosed as being used on a glove box of a vehicle.

The glove box latch that is disclosed by the Taranto reference does not suffer from the problems that are addressed by the Jackson et al. reference. The Taranto reference does not mention anything at all that is even remotely related to a desire to keep fluids from flowing through a latch in a glove box door.

Further, the Jackson et al. reference does not teach or suggest that it is important to prevent fluid flow within glove box latches. Rather, the Jackson et al. reference is only concerned with aircraft exterior panel latches and the problem with permitting fluid flow through these latches and does not teach or suggest that glove box latches suffer from fluid flow.

Clearly, the Examiner’s alleged motivation is completely inapplicable and irrelevant to glove box latches and Appellants respectfully submit that one of ordinary skill in the art would not have been motivated to modify the glove box latch that is disclosed by the Taranto reference to include an O-ring because the Jackson et al. reference teaches that an O-ring is valuable for preventing fluid flow to prevent a flow through the latch mechanism “into the interior of the aircraft” and also to prevent “Fluid, such as pressurized air, flowing outwardly from an internal compartment of an aircraft.”

Moreover, Appellants respectfully submit that these references would not have been combined as alleged by the Examiner because the references are directed to completely different matters and problems.

In particular, the Taranto reference is concerned with the problem of “retaining the glove box of the vehicle in a closed position during a crash.” (Col. 1, lines 23 - 61).

In stark contrast, the Jackson et al. reference is concerned with the completely different and unrelated problem of providing a latch mechanism to “releasably secure a first aircraft structure, such as an aircraft panel or cowling, to a second aircraft structure “ while preventing “a liquid or gas, to flow through the latch mechanism between the exterior of the panel and the interior of the panel.” (Col. 1, lines 5 - 59).

One of ordinary skill in the art who was concerned with the problem of retaining a glove box of a vehicle in a closed position during a crash, as the Taranto reference is concerned with addressing, would not have referred to the Jackson et al. reference, and vice-versa, because the Jackson et al. reference is concerned with the completely different and unrelated problems of releasably securing a first aircraft structure, such as an aircraft panel or cowling, to a second aircraft structure while preventing a liquid or gas from flowing through the latch mechanism between the exterior of the panel and the interior of the panel. Thus, one of ordinary skill in the art would not have combined these references.

Therefore, the Board of Appeals is respectfully requested to withdraw these rejections of claims 1-2, 5-9, and 22-24.

3. The Taranto and Jackson et al. references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the invention of claims 10-12, and 21.

Regarding the rejections of claims 10-12, and 21, the Examiner alleges that the Jackson et al. reference would have been combined with the Taranto reference to form the claimed invention. Appellants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

As explained above, none of the applied references teaches or suggests the features of the claimed invention including a lock with an O-ring in a containing groove on a cam where the containing groove communicates with a cam groove in the cam. As explained above, this

feature is important for providing a sliding resistance that restrains any impact noise while enabling the cam member to be downsized.

Indeed, the Examiner never alleges that any of the applied references teaches or suggests these features.

The Examiner admits that the Taranto reference does not teach or suggest an O-ring.

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Further, Appellants respectfully submit that, contrary to the Examiner's allegation, one of ordinary skill in the art would not have been motivated to modify the teachings of the Taranto reference with the O-ring that is disclosed by the Jackson et al. reference "in order to create a fluid-tight seal."

The Jackson et al. reference teaches that the motivation for providing a fluid-tight seal is that the latch mechanism that is disclosed by the Jackson et al. reference is intended to be used on an exterior panel of an aircraft so as to secure a first aircraft structure, such as an aircraft panel or cowling, to a second aircraft structure, and that it is desirable to prevent a flow through the latch mechanism "into the interior of the aircraft" and also to prevent "Fluid, such as pressurized air, flowing outwardly from an internal compartment of an aircraft."

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The glove box latch that is disclosed by the Taranto reference does not suffer from the problems that are addressed by the Jackson et al. reference. The Taranto reference does not mention anything at all that is even remotely related to a desire to keep fluids from flowing through a latch in a glove box door.

Further, the Jackson et al. reference does not teach or suggest that it is important to

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Clearly, the Examiner's alleged motivation is completely inapplicable and irrelevant to glove box latches and Appellants respectfully submit that one of ordinary skill in the art would not have been motivated to modify the glove box latch that is disclosed by the Taranto reference to include an O-ring because the Jackson et al. reference teaches that an O-ring is valuable for preventing fluid flow to prevent a flow through the latch mechanism "into the interior of the aircraft" and also to prevent "Fluid, such as pressurized air, flowing outwardly from an internal compartment of an aircraft."

Moreover, Appellants respectfully submit that these references would not have been combined as alleged by the Examiner because the references are directed to completely different matters and problems.

In particular, the Taranto reference is concerned with the problem of "retaining the glove box of the vehicle in a closed position during a crash." (Col. 1, lines 23 - 61).

In stark contrast, the Jackson et al. reference is concerned with the completely different and unrelated problem of providing a latch mechanism to "releasably secure a first aircraft structure, such as an aircraft panel or cowl, to a second aircraft structure " while preventing "a liquid or gas, to flow through the latch mechanism between the exterior of the panel and the interior of the panel." (Col. 1, lines 5 - 59).

One of ordinary skill in the art who was concerned with the problem of retaining a glove box of a vehicle in a closed position during a crash, as the Taranto reference is concerned with addressing, would not have referred to the Jackson et al. reference, and vice-versa, because the Jackson et al. reference is concerned with the completely different and unrelated problems of releasably securing a first aircraft structure, such as an aircraft panel or cowl, to a second aircraft structure while preventing a liquid or gas from flowing through the latch mechanism between the exterior of the panel and the interior of the panel. Thus, one of ordinary skill in the art would not have combined these references.

Further, the Examiner clearly fails to present a *prima facie* case of obviousness by failing to provide any prior art reference which discloses engaging holes, by failing to provide any prior art reference which teaches that engaging holes are the functional

equivalent of an annular groove, and by failing to provide a prior art reference which provides a motivation for replacing the annular groove which is disclosed by the Taranto reference with an undisclosed engaging holes.

The Examiner fails to present a *prima facie* case of obviousness for at least two reasons: 1) the Examiner has failed to provide any suggestion and/or motivation which would motivate one of ordinary skill in the art to replace the engagement groove with engaging holes; and 2) the Examiner has failed to provide any reference which discloses engaging holes, let alone that teaches that engaging holes are the functional equivalent of the engagement groove.

“ESTABLISHING A PRIMA FACIE CASE OF OBVIOUSNESS”

“To establish a prima facie case of obviousness three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine references teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.” (Emphasis original, M.P.E.P. § 2142, see also § 2143).

In the present instance, the Examiner has failed to present a *prima facie* case of obviousness by failing to provide “some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference” and by failing to provide a prior art reference that teaches or suggests all the claim limitations.

The Examiner admits that the Taranto reference “does not disclose engagement holes.” The Examiner does not provide any prior art reference which teaches engagement holes. Therefore, the Examiner clearly fails to satisfy the requirement for a *prima facie* case of obvious of a “prior art reference (or references when combined) must teach or suggest all the claim limitations.”

The Examiner also fails to present a *prima facie* case of obviousness by failing to provide “some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference.”

Rather, the Examiner merely alleges that engagement holes are the “functional

equivalents” to the annular recess 62 that is disclosed by the Taranto reference.

***“COMBINING EQUIVALENTS KNOWN FOR THE SAME
PURPOSE”***

“It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose . . . [T]he idea of combining them flows logically from their having been individually taught in the prior art.” (Emphasis added, M.P.E.P. § 2144.06).

In the present instance, the idea of combining them cannot “flow” because they are not “individually taught” in the applied references. The Examiner has not provided a prior art reference that discloses engaging holes, let alone a prior art reference which teaches that engaging holes are the functional equivalent of an annular groove.

Moreover, even assuming for the sake of argument, that the Examiner is able to locate prior art which not only discloses engaging holes, but which also teaches that engaging holes are the functional equivalent of the annular groove that is disclosed by the Taranto reference, such teachings would still be insufficient to provide a *prima facie* case of obviousness.

***“SUBSTITUTING EQUIVALENTS KNOWN FOR THE SAME
PURPOSE”***

“In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant’s disclosure or the mere fact that the components at issue are function or mechanical equivalents. . . .The Board found the claimed invention would have been obvious, reasoning that the prior art foam core is the function and mechanical equivalent of the claimed paper core. The court reversed, holding that components which are functionally or mechanically equivalent are not necessarily obvious in view of one anotherSmith v. Hayashi.”

Therefore, even if the Examiner was able to locate prior art which not only discloses engaging holes, but which also teaches that engaging holes are the functional equivalent of the annular groove that is disclosed by the Taranto reference, such a disclosure of functional equivalency is not sufficient to establish a *prima facie* case of obviousness. The Examiner would still be required to provide a motivation for one of ordinary skill in the art to substitute

engagement holes for the annular groove.

Clearly, the Examiner has not even attempted to allege any motivation at all.

Therefore, the Examiner fails to present a *prima facie* case of obviousness.

Indeed, the Examiner's allegation that such are "functional equivalents" nullifies any future attempt by the Examiner to allege that one of ordinary skill in the art would have been motivated to substitute engaging holes for the annular recess 62. Even assuming *arguendo* that the Examiner had cited a prior art reference which disclosed engaging holes as recited by the claims, one of ordinary skill in the art would not have been motivated to replace the annular recess 62 with such engaging holes because the Examiner has admitted that the annular recess 62 is the functional equivalent of engaging holes. If, as alleged by the Examiner, they are functionally equivalent, there clearly can be no motivation to replace the annular groove that is disclosed by the Taranto reference by engagement holes (which are not disclosed anywhere).


Therefore, the Board of Appeals is respectfully requested to withdraw these rejections of claims 10-12, and 21.

IX. CONCLUSION

Appellant requests withdrawal of the rejections of claims 1-2, 5-12, and 21-26 under 35 U.S.C. § 103(a).

Date: 3/8/07

Respectfully Submitted,


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Attachment:
Claims Appendix

IX. CLAIMS APPENDIX

Claim 1. A lock apparatus for attaching a container member to a support member openably, the lock apparatus comprising:

- an operation handle;
- a spring, which is movably supported by the container member;
- a slide pin, which is urged in a direction of a lock hole defined on the support member by the spring, respectively;
- a cam member to which a rear end portion of the slide pin is fitted to urge the slide pin to project and retract; and
- an O-ring in a containing groove of the cam member, wherein:
 - when the operation handle is operated in a swing manner, a front end portion of the slide pin is retracted from the lock hole of the support member against pressure of the spring;
- and
- the containing groove communicates with a cam groove on the cam member.

Claim 2. The lock apparatus according to claim 1, wherein the rear end portion of the slide pin is connected to the cam member to be swingable.

Claim 3. The lock apparatus according to claim 23, further comprising:

- a stopper piece between the elastic pieces of the slide pin; and
- an elastic contact piece, for elastically contacting with the stopper piece, on a surface of the cam member, which corresponds to the stopper piece.

Claim 4. The lock apparatus according to claim 3, wherein a rib wall, for preventing erroneous assembly, is provided on an inner side surface of the cam member, which is opposed to the elastic contact piece of the cam member.

Claim 5. The lock apparatus according to claim 1, further comprising:

- an outer cylindrical member continuously formed on one of the operation handle and the slide pin, wherein the O-ring slide-contacts with the outer cylindrical member and the cylindrical portion of the cam member simultaneously.

Claim 6. The lock apparatus according to claim 5, wherein the cylindrical portion of the cam member comprises the containing groove to which the O-ring is attached.

Claim 7. The lock apparatus according to claim 6, wherein the containing groove is formed in a recessed shape to isolate the O-ring.

Claim 8. The lock apparatus according to claim 6, further comprising:
a projected portion on the outer cylindrical member,
wherein the projected portion moves in the cam groove; and
the cam groove is on the cylindrical portion of the cam member.

Claim 9. The lock apparatus according to claim 5, wherein:
the outer cylindrical member comprises a bottom surface;
the lock apparatus further comprises: a projected portion on the other of the cylindrical portion of the cam member and the outer cylindrical member;
the cam groove is on one of the cylindrical portion of the cam member and the outer cylindrical member;
the projected portion moves in the cam groove; and
the projected portion and the cam groove are in a space blocked by the O-ring.

Claim 10. A lock comprising:
a cam comprising a pair of engaging holes;
a slide pin comprising a bifurcated structure comprising elastic pieces that each comprises projections that each engage a corresponding one of said pair of engaging holes;
and
an O-ring in a containing groove on the cam, wherein the containing groove communicates with a cam groove in the cam.

Claim 11. The lock of claim 10, wherein said pair of engaging holes are provided on opposing surfaces of a cylindrical portion of said cam.

Claim 12. The lock of claim 10, wherein said slide pin is swingably connected to said

cam by the engagement of said projection with said corresponding one of said pair of engaging holes.

Claim 13. The lock of claim 10, wherein said slide pin further comprises a stopper between said elastic pieces.

Claim 14. The lock of claim 13, wherein said cam further comprises an elastic contact for contacting said stopper.

Claim 15. The lock of claim 14, wherein said cam further comprises a rib wall on an inner side surface and opposing said elastic contact.

Claim 16. The lock of claim 10, further comprising:
a handle,
wherein one of said handle and said slide pin comprises an outer cylindrical member,
and
wherein said O-ring simultaneously, slidingly contacts said outer cylindrical member and a cylindrical portion of said cam.

Claim 17. The lock of claim 16, wherein said cam comprises the containing groove on said cylindrical portion that receives said O-ring.

Claim 18. The lock of claim 17, wherein said containing groove is recessed.

Claim 19. The lock of claim 17, wherein said cam comprises the cam groove on said cylindrical portion that communicates with said containing groove, and wherein said outer cylindrical member comprises a projection received by said cam groove.

Claim 20. The lock of claim 16, wherein:
said outer cylindrical member comprises a bottom surface;
one of said cylindrical portion of said cam and said outer cylindrical member comprises the cam groove; and

the other of said cylindrical portion of said cam and said outer cylindrical member further comprises a projection received by said cam groove such that said projection is blocked by said O-ring.

Claim 21. The lock of claim 12, wherein said slide pin swings about an axis that is substantially perpendicular to an elongate axis of said slide pin.

Claim 22. The lock apparatus of claim 1, wherein engagement holes are defined on opposed surfaces of a front end portion of the cam member having a cylindrical portion.

Claim 23. The lock apparatus of claim 22, wherein the rear end portion of the slide pin is formed in a bifurcated structure comprising elastic pieces.

Claim 24. The lock apparatus of claim 23, wherein each of said elastic pieces comprises a protrusion for detachably engaging with each of said engagement holes.

Claim 25. A lock apparatus for attaching a container member to a support member openably, the lock apparatus comprising:

- an operation handle;

- a spring which is movably supported by the container member;

- a slide pin which is urged in a direction of lock holes defined on the support member by the spring; and

- a cam member to which a rear end portion of the slide pin is fitted to urge the slide pin to project and retract, wherein:

 - when the operation handle is operated in a swing manner, a front end portion of the slide pin is retracted from a lock hole of the support member against pressure of the spring;

 - engagement holes are defined on opposed surfaces of a front end portion of the cam member having a cylindrical portion;

 - a rear end portion of the slide pin is formed in a bifurcated structure comprising elastic pieces;

 - each of said elastic pieces comprises a protrusion for detachably engaging with said engagement holes; and

rotation of said slide pin with respect to the cam member disengages the protrusions from the engagement holes.

Claim 26. A lock comprising:

a cam that comprises a pair of engaging holes; and

a slide pin comprising a bifurcated structure comprising elastic pieces that each comprises projections that each engage a corresponding one of said pair of engaging holes, wherein rotation of the slide pin with respect to the cam disengages the projections from the engagement holes.

X. EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. Sections 1.130, 1.131, or 1.132 and the Examiner has not entered any other evidence that is relied upon by the Appellant in this appeal.

XI. RELATED PROCEEDINGS APPENDIX

No decisions have been rendered by any court or the Board in any proceeding which is relevant to paragraph (c)(1)(ii) of 37 C.F.R. Section 41.37.